

A Multi-interface Adaptive Hypermedia System to Promote Consumer-Provider Partnership in Chronic Disease Management

Maria Lundström¹, Jim Warren, PhD¹, Sara Jones PhD², Frank Chung BPharm, MIT¹
¹Advanced Computing Research Centre, University of South Australia, Adelaide, Australia
²School of Physiotherapy, University of South Australia, Adelaide, Australia

Abstract

Much of chronic disease management depends on active partnership of consumer and provider. Our system promotes diabetes management through profiling and adaptive support of both consumer and provider. We use a University Podiatry Clinic and diabetes consumer information portal as inter-related contexts that share profile information.

Background

Diabetic patients must routinely manage most aspects of their own care and make informed decisions about lifestyle.^{1,2} To succeed in this it is essential to have partnership and effective communication between patients and health providers.² However, health professionals often lack the time required, resulting in unsatisfying and inadequate patient consultations where patients' concerns are not met.² Furthermore, it is critical that providers exploit contact with the patient to assess chronic disease risk factors and management strategies. We address these issues in our system design. Key to the approach is profiling of both patient and provider to drive adaptation of multiple user interfaces. Our field laboratory is the University of South Australia Podiatry Clinic and a linked web-based consumer education portal. Quality of diabetic foot care is the immediate aim.

Methods

Working with University podiatry educators, we have modeled podiatry assessment and planning activities, and created a concept map of stereotypical podiatry student knowledge by year level. In this context we have identified a number of behavioral markers of quality data collection and associated assessment and planning in podiatry consultations with a focus on management of diabetic foot complications. These requirements form the basis for interactive decision support. All decision support is linked to the concept map to allow re-assessment and individualization of student knowledge profiles and to allow the student to engage in postconsultation web-based learning with direct reference to their cases from the clinic.

Sharon, a prototype adaptive diabetes consumer information web portal³, has been extended to engage in two-way communication with the podiatry clinic server: (a) to identify risk factors and other consumer profile information captured in the podiatry clinic for

subsequent tailoring of patient information; and (b) to inform the clinic of any patient questions identified during the patient's online interaction that may productively be raised in the consultation.

Architecture

Podiatry students use iPAQ handheld computers with intermittent Bluetooth communication to a server machine to record their assessment and plan with interactive decision support. Results update the podiatry server database (and cause printing to augment the paper record – our trial has not replaced this). The podiatry student's profile is updated to inform future decision support and to tailor the student's web learning environment for post-clinic study.

SOAP (Simple Object Access Protocol) is used to interrogate Sharon for relevant patient questions prior to the podiatry consult and to update Sharon with patient profile details post-consult. Patient questions from Sharon appear on the podiatrist iPAQ as an integral part of the consultation workflow.

Conclusion

We aim to improve both provider and patient behavior in chronic disease management, and to bring the two into closer partnership. Our system provides educational support for both patient and podiatrist, critiques and prompts for high quality in podiatrist assessment and planning, and provides a novel channel for patient questions to reach the provider. Upcoming field trials will assess whether we have achieved an acceptable system that improves quality of management activities

References

1. Funnell MM, Anderson RM. The problem with compliance in diabetes. *MSJAMA online* 2000; 13(284):1709.
2. Pooley CG, Gerrard C, Hollis S, Morton S, Astbury J. 'Oh it's a wonderful practice... you can talk to them': a qualitative study of patients' and health professionals' view on the management of type 2 diabetes. *Health and Social Care in the Community* 2001; 9(5):318-326.
3. Ma C, May L, Mugford C, Zimny D, Stanek J & Warren J, "A Complete Diabetes Patient Profile for Consumer Partnership in Care," *Informatics in Primary Care*, Vol. 10, pp. 235-236, 2002.